

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI EXAMINATION – SUMMER 2025

Subject Code: 3160213

Date: 30-05-2025

Subject Name: Special Purpose Vehicle

Time: 10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	MARKS
Q.1 (a) Describe following types of SPV'S in short:	03
(i) Hauling (ii) Hoisting (iii) Conveying	
(b) Compare wheeled vehicle with tracked vehicle on the basis of;	04
(i) Ground pressure (ii) Suspension (iii) Steering (iv) Speed	
(c) Write a note on ergonomic considerations in SPV.	07
Q.2 (a) Discuss the effects of flywheel size in a power system of SPV.	03
(b) Describe economics of special purpose vehicle utilization.	04
(c) Explain working principle and design consideration of lubrication system of SPV.	07
OR	
(c) Explain working principle and design consideration of hydraulic control circuits of SPV.	07
Q.3 (a) Give the selection criteria of earth moving machines.	03
(b) Explain three way tipper mechanism.	04
(c) Draw a diagram and explain the operation of power shovel.	07
OR	
Q.3 (a) Give the types of forklift and explain each in short.	03
(b) Explain the various types of excavator buckets.	04
(c) Explain construction and working of backhoe with neat sketch.	07
Q.4 (a) Discuss the selection criteria of a tractor.	03
(b) Write a short note on power take off unit.	04
(c) Describe three point linkage type tractor hitches with neat sketch.	07
OR	
Q.4 (a) Give the types of tractor drawn implements.	03
(b) Write a short note on power tiller.	04
(c) Draw a layout of a power transmission of a tractor and give the functions of differential unit.	07
Q.5 (a) Classify cranes and give the characteristics of truck crane.	03
(b) Describe fifth wheel arrangement of a truck.	04
(c) Explain telescopic crane with neat diagram.	07
OR	
Q.5 (a) List out various types of semi trailers.	03
(b) Write a short note on fire extinguishing vehicle.	04
(c) Explain the lattice boom crawler crane with neat sketch.	07

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2024

Subject Code:3160213

Date:24-05-2024

Subject Name:Special Purpose Vehicle

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

Q.1	(a) Classify the special purpose vehicle	03
	(b) Explain Scrapers.	04
	(c) Explain design consideration of electrical system of Special Purpose Vehicle.	07
Q.2	(a) Explain Track Type Special Purpose Vehicle.	03
	(b) Explain working principles of lubrication system of Special Purpose Vehicle.	04
	(c) Explain working principle and design consideration of Final Drive.	07
	OR	
	(c) Explain the working of Steering system of Special Purpose Vehicle with neat sketch.	07
Q.3	(a) Write short note on PTO unit.	03
	(b) Enlist different types of accessories of Wheeled Tractors use.	04
	(c) Elaborate special features of tractor.	07
	OR	
Q.3	(a) Enlist different types Crane are used.	03
	(b) Write short note on safety device of Crane.	04
	(c) Explain construction and working principle of Mobile Crane with neat sketch.	07
Q.4	(a) Give the advantage and limitation of Ripper.	03
	(b) Explain comparison of Wheel loader and Power Shovel.	04
	(c) Draw the sketch showing the construction of Wheel loaders and explain its purpose and working in detail.	07
	OR	
Q.4	(a) What are Articulated Vehicles?	03
	(b) Explain construction feature of Forklift.	04
	(c) Explain purpose, construction and working Tipper in detail.	07
Q.5	(a) Write short note on comfort in special purpose vehicle.	03
	(b) Write short note on Fire Extinguishing Vehicle.	04
	(c) Write the importance of Ergonomics in Vehicle Designing	07
	OR	
Q.5	(a) Write short note on Hover Craft	03
	(b) Explain economics of special purpose vehicle utilization.	04
	(c) Explain human factor in special purpose vehicle design with reference to vibration and thermal stress on human performance.	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-VI (NEW) EXAMINATION – SUMMER 2023****Subject Code:3160213****Date:14-07-2023****Subject Name:Special Purpose Vehicle****Time:10:30 AM TO 01:00 PM****Total Marks:70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

		MARKS
Q.1	(a) What are the limitations of tracked vehicles?	03
	(b) What is the difference between trailer and semi trailer? List out at least six types of semi trailers.	04
	(c) Write the function of following special purpose vehicles. (i) Backhoe (ii) Compactor (iii) Motor Grader (iv) Skid Steer Loader (v) Trencher (vi) scraper (vii) Tipper	07
Q.2	(a) Describe the effects of flywheel size in a power system of SPV.	03
	(b) Explain the design consideration of final drive of Special Purpose Vehicles.	04
	(c) Explain the working of three way tipping mechanism with neat diagram.	07
	OR	
	(c) Show the main components of hovercraft in a diagram and explain each component with detail.	07
Q.3	(a) Discuss the basic goals of ergonomics in design of special purpose vehicle.	03
	(b) Explain power take off unit of a tractor in brief.	04
	(c) Draw a layout of power transmission system of a tractor and explain the working of differential unit.	07
	OR	
Q.3	(a) Discuss the effects of noise and vibration on human performance.	03
	(b) What are the criteria for the selection of a farm tractor?	04
	(c) Explain three point linkage type hitch of a tractor with neat sketch.	07
Q.4	(a) Explain various types of road roller in brief.	03
	(b) Explain different types of bulldozer blades.	04
	(c) What is the function of a Power shovel? Draw a neat sketch and explain the basic parts and operation of it.	07
	OR	
Q.4	(a) Compare loader with excavators.	03
	(b) Describe the lifting mechanism of a forklift.	04
	(c) Explain the special features and working of excavators with neat sketch.	07
Q.5	(a) Give the classification of a crane and write the operating characteristics of mobile Cranes.	03
	(b) Explain the various types of pump used in crane operation.	04
	(c) Describe hydraulic control system of a tractor with neat diagram.	07
	OR	
Q.5	(a) Write the function of crane parts: (i) Boom (ii) Outriggers (iii) Rotex Gear	03
	(b) Explain the control system and safety devices of mobile crane.	04
	(c) Explain Constructional and working features of an ambulance.	07

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER–VI (NEW) EXAMINATION – SUMMER 2022****Subject Code:3160213****Date:10/06/2022****Subject Name:Special Purpose Vehicle****Time:10:30 AM TO 01:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

MARKS

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|------------|---|-----------|
| Q.1 | (a) Explain in brief articulated vehicle. | 03 |
| | (b) Explain any two steering gear box with neat sketch. | 04 |
| | (c) Classify the special purpose vehicles and give the application of each. | 07 |
| Q.2 | (a) Enlist different types of crane are used in SPV. | 03 |
| | (b) Explain the working of hover craft. | 04 |
| | (c) Explain forklift with its uses and operation techniques. | 07 |
| | OR | |
| | (c) Write short note on PTO shaft. Explain three standard types of PTO drives. | 07 |
| Q.3 | (a) Give the advantage and limitation of ripper. | 03 |
| | (b) Explain the construction of Mobile crane. | 04 |
| | (c) Describe dozer. Explain different types of dozer blades. | 07 |
| | OR | |
| Q.3 | (a) What is the function of power shovel? | 03 |
| | (b) Explain advantages and disadvantages of multi axle vehicles. | 04 |
| | (c) Explain working principle and design consideration of final drive. | 07 |
| Q.4 | (a) Classify the tractor. How tractor is selected? | 03 |
| | (b) Explain with neat sketch of dumper. | 04 |
| | (c) Explain Constructional working features of tipper. | 07 |
| | OR | |
| Q.4 | (a) Discuss about power take off unit. | 03 |
| | (b) Explain different types of road roller. | 04 |
| | (c) List the various types of excavators and explain any one excavator in detail. | 07 |
| Q.5 | (a) Explain thermal stresses on human performance. | 03 |
| | (b) Different between wheel and track type vehicle. | 04 |
| | (c) Make a layout of tractor & give the name of main components used in tractor. | 07 |
| | OR | |
| Q.5 | (a) Function of (1) Ripper (2)Scraper (3)Power shovel | 03 |
| | (b) Explain air brake system in SPV with neat sketch. | 04 |
| | (c) Explain human factors in SPV design with reference to comfort. | 07 |
